

CLAIMS

What is claimed is:

1. A method for mapping a virtual memory page to a real memory page frame in a multiprocessing environment that supports a multiplicity of operating system images, the method comprising:
  - 5 retrieving into an operating system image, from memory accessible to a multiplicity of operating system images, a most recently used cache color for a cache, wherein the cache is shared by the operating system image with at least one other operating system image;
  - 10 selecting a new cache color in dependence upon the most recently used cache color;
  - selecting in the operating system image a page frame in dependence upon the new cache color; and
  - 15 storing in the memory the new cache color as the most recently used cache color for the cache.
2. The method of claim 1 wherein retrieving a most recently used cache color for a cache further comprises retrieving a most recently used cache color for a cache from a hypervisor.
3. The method of claim 1 wherein cache color comprises a predetermined range of bits in a real memory address.
4. The method of claim 1 wherein cache color comprises an intersection of a page frame number and a cache index for a real memory address.

5. The method of claim 1 wherein selecting a new cache color in dependence upon the most recently used cache color further comprises incrementing the value of the most recently used cache color.
6. The method of claim 1 wherein selecting in the operating system image a page frame in dependence upon the new cache color further comprises:  
  
searching for a free page frame of the new cache color;  
  
5 if a page frame of the new cache color is found, storing the page frame number of the found page frame in association with a virtual page number.
7. The method of claim 1 further comprising:  
  
allocating a range of virtual memory to an operating system image; and  
  
5 receiving in the operating system image a request to access a virtual memory page not yet mapped to a page frame.
8. The method of claim 1 wherein storing in the memory the new cache color as the most recently used cache color for the cache further comprises calling a function in a hypervisor.

9. A system for mapping a virtual memory page to a real memory page frame in a multiprocessing environment that supports a multiplicity of operating system images, the system comprising:
- 5 means for retrieving into an operating system image, from memory accessible to a multiplicity of operating system images, a most recently used cache color for a cache, wherein the cache is shared by the operating system image with at least one other operating system image;
- 10 means for selecting a new cache color in dependence upon the most recently used cache color;
- means for selecting in the operating system image a page frame in dependence upon the new cache color; and
- 15 means for storing in the memory the new cache color as the most recently used cache color for the cache.
10. The system of claim 9 wherein means for retrieving a most recently used cache color for a cache further comprises means for retrieving a most recently used cache color for a cache from a hypervisor.
11. The system of claim 9 wherein means for selecting a new cache color in dependence upon the most recently used cache color further comprises means for incrementing the value of the most recently used cache color.
12. The system of claim 9 wherein means for selecting in the operating system image a page frame in dependence upon the new cache color further comprises:

- 5 means for searching for a free page frame of the new cache color; and
- means for storing the page frame number of the found page frame in association with a virtual page number.
13. The system of claim 9 further comprising:
- means for allocating a range of virtual memory to an operating system image; and
- 5 means for receiving in the operating system image a request to access a virtual memory page not yet mapped to a page frame.
14. The system of claim 9 wherein means for storing in the memory the new cache color as the most recently used cache color for the cache further comprises means for calling a function in a hypervisor.

15. A computer program product for mapping a virtual memory page to a real  
5 memory page frame in a multiprocessing environment that supports a  
multiplicity of operating system images, the computer program product  
comprising:
- a recording medium;
- 10 means, recorded on the recording medium, for retrieving into an operating  
system image, from memory accessible to a multiplicity of operating system  
images, a most recently used cache color for a cache, wherein the cache is  
shared by the operating system image with at least one other operating system  
15 image;
- means, recorded on the recording medium, for selecting a new cache color in  
dependence upon the most recently used cache color;
- 20 means, recorded on the recording medium, for selecting in the operating  
system image a page frame in dependence upon the new cache color; and
- means, recorded on the recording medium, for storing in the memory the new  
cache color as the most recently used cache color for the cache.
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16. The computer program product of claim 15 wherein means, recorded on the  
recording medium, for retrieving a most recently used cache color for a cache  
further comprises means, recorded on the recording medium, for retrieving a  
most recently used cache color for a cache from a hypervisor.
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17. The computer program product of claim 15 wherein means, recorded on the  
recording medium, for selecting a new cache color in dependence upon the  
most recently used cache color further comprises means, recorded on the

5 recording medium, for incrementing the value of the most recently used cache color.

18. The computer program product of claim 15 wherein means, recorded on the recording medium, for selecting in the operating system image a page frame in dependence upon the new cache color further comprises:

5 means, recorded on the recording medium, for searching for a free page frame of the new cache color; and

means, recorded on the recording medium, for storing the page frame number of the found page frame in association with a virtual page number.

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19. The computer program product of claim 15 further comprising:

means, recorded on the recording medium, for allocating a range of virtual memory to an operating system image; and

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means, recorded on the recording medium, for receiving in the operating system image a request to access a virtual memory page not yet mapped to a page frame.

10 20. The computer program product of claim 15 wherein means, recorded on the recording medium, for storing in the memory the new cache color as the most recently used cache color for the cache further comprises means, recorded on the recording medium, for calling a function in a hypervisor.